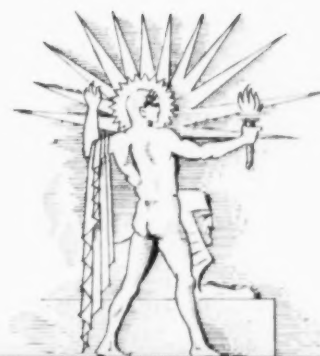
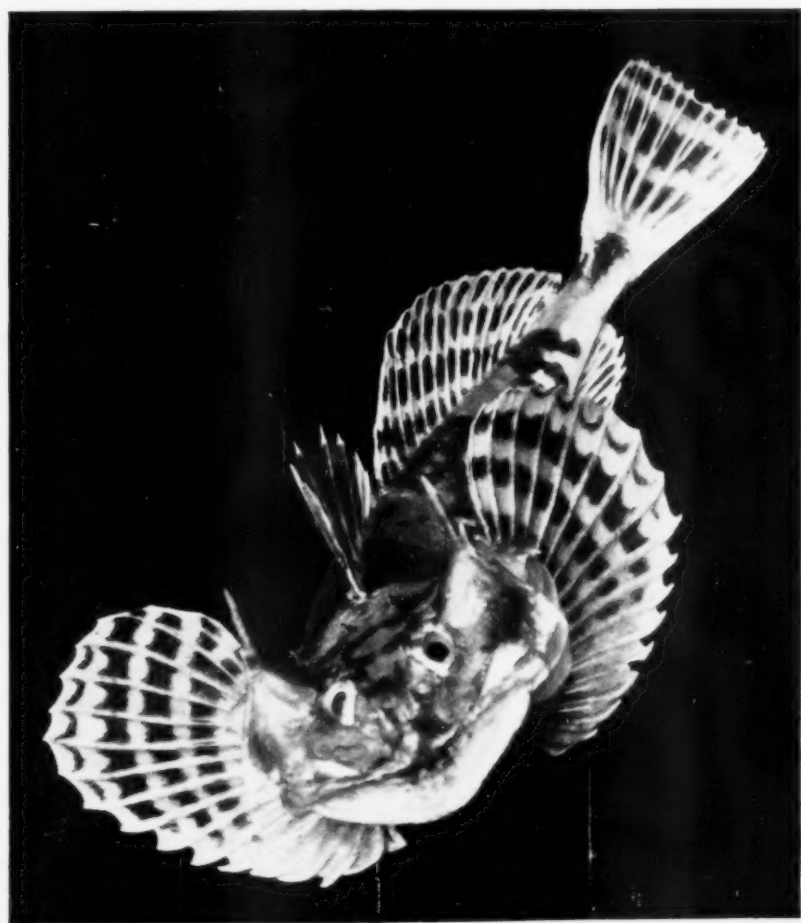


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W. H. R. G. S.

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



NOVEMBER 22, 1930

Spiny Sculpin Uses Chinese Camouflage

See Page 329

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Summary ofCurrent
Science

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DO YOU KNOW THAT

A baby elephant can walk at birth.

When the nations enlisted fighting men for the war, the United States found that one man out of four could not read, whereas in England the rate was one out of 100, and in Germany one out of 5,000.

An American Institute for Persian Art and Archaeology, newly organized, plans to sponsor expeditions from American museums to explore buried Persian cities.

Soap was first used not for cleanliness but to make the hair more attractive.

One-fourth of the workers in the United States are engaged in lines of industry and service unknown thirty years ago.

The first steel pens were made by a London stationer, in 1803.

In making their heavy boots, Eskimos use coarse whale sinew for thread.

Of the 67,000,000 watermelons on the United States market last year, 91 per cent. were of the Tom Watson variety.

A method of injecting chemicals into trees in order to kill beetle pests that infest the trees is being tried by government entomologists.

The wide open season for ice cream eating in the United States is from April to October inclusive, judging by the fact that three-fourths of the milk supply for commercial ice cream is used in those months.

Pieping's population is now only 900,000, as compared with 1,250,000 a year ago.

A synthetic flexible glass claimed to be weatherproof, acidproof, fireproof and sea-waterproof is being produced.

WITH THE SCIENCES THIS WEEK

AFRONAUTICS		ENTOMOLOGY	
Radio Landing Beam Developed	324	Fruit Fly Quarantine	328
AGRICULTURE		GENERAL SCIENCE	
Rotary Milking Machine	325	Glances at Books	335, 336
ANTHROPOLOGY		Research Council Grants	333
Australian Savages	329	Research Funds	329
Eye Color	326	MEDICINE	
Gypsum Cave Digging Resumed	327	Car Sickness	325
ARCHAEOLOGY		Infantile Paralysis Virus	328
Ancient Mexican Tribes	333	Pseudo-Appendicitis	329
Santa Claus	329	ORNITHOLOGY	
ASTRONOMY		Grosbeak	334
Making A Bigger Telescope	330	PHYSICS	
BIOLOGY		Raman Wins Nobel Prize	323
Fantastic Fish	329	PSYCHOLOGY	
CHEMISTRY		Employee Attitudes	328
Nobel Prize Awarded Fischer	323	PUBLIC HEALTH	
CRIMINOLOGY		Cancer Fatalities	328
Bertillon Identification	326	Dust Avalanche	327
DIETETICS		White House Child Conference	332
Sugar Cane	328	RADIO	
ELECTRICITY		Landing Beam for Airplanes	324
Vacuum Tube Nursemaid	329	ZOOLOGY	
ENGINEERING		Musk Oxen	332
Dust Avalanche	327		
Testing Equipment	328		

Science Service presents on the radio, an address,

SOME MISCONCEPTIONS ABOUT THE AMERICAN INDIAN

By Dr. M. W. Stirling, chief of the Bureau of American Ethnology of the Smithsonian Institution and leading authority on the aborigines of America
Friday, November 28, 1930, at 3:45 p. m., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

PHYSICS

Indian Scientist Awarded Nobel Physics Prize

His Discovery That Light Changes Color When Shining On Transparent Substances Brings Him Honor

THE DISCOVERY that light of a single color, or wavelength, shining on certain transparent substances, is partly changed to other colors is regarded as the greatest accomplishment so far of Sir Chandrasekhara Venkata Raman, Indian scientist of the University of Calcutta, who has just been awarded the Nobel Prize in physics. Named after its discoverer, this phenomenon is now known as the Raman effect, and it was first announced in the spring of 1928.

One of the first scientists, outside of Sir Chandrasekhara's own laboratory, to verify it was Dr. R. W. Wood, of the Johns Hopkins University. Working at the private laboratory of Alfred L. Loomis, Tuexdo Park, N. Y., Prof. Wood considerably improved the original apparatus of the Indian scientist and detected the effect in the summer of 1928.

The Raman effect occurs when monochromatic light (which is light of a single color, or wavelength) shines on transparent substances, such as quartz, chloroform, or water. Generally a mercury arc is used as the light source. The light that is scattered by the transparent material is mostly of the same color as that of the light illuminating it. The spectroscope, the instrument that analyzes light, however, shows that part of this light is changed to wavelengths a little longer or shorter than that of the source. That is, part of the light is either more reddish or more bluish.

On the spectrum photographs, the result is a heavy line, representing the main color, attended on either side by narrower and fainter lines. The fainter lines on one side are arranged the same way as those on the other, except that they are reversed, as if reflected in a mirror, the center heavy line being the mirror. Sir Chandrasekhara, in his first experiments, found only a single and very faint line on the high frequency, or blue, side of the main one; but with the improved apparatus Prof. Wood found groups of nearly equal strength on each side.

The great importance of the discovery came from the fact that the differences between the frequency of the exciting color, used to illuminate the substance, and the frequency of the additional, or Raman, lines are precisely the same as the frequencies of the infrared absorption bands of the same substance. These absorption bands, that is, the bands of color absorbed by the substance with infrared light, or light vibrating too slowly to be seen, are very difficult to determine directly, so the Raman effect is a very convenient means of studying them. Thus it gave a new means of studying the properties of the molecules of these substances, and of the structure of light.

Sir Chandrasekhara was born in India on November 7, 1888, and graduated from the Presidency College in Madras in 1904. In 1907 he joined the Indian Finance Department, and after that held various scientific positions, finally becoming Sir Taraknath Palit professor of physics at Calcutta University and honorary professor at Benares Hindu University. In 1924 he visited the United States, following the meeting of the British Association for the Advancement of Science at Toronto, to attend the



SIR CHANDRASEKHARA VENKATA RAMAN

Professor of physics at the University of Calcutta and discoverer of the Raman effect. He has just been awarded the Nobel prize in physics in recognition of his work.

centenary celebration of the Franklin Institute in Philadelphia. After that he served for a time as research associate at the California Institute of Technology at Pasadena. In the same year he was made a fellow of the Royal Society, the highest British scientific body. He was knighted in 1929.

Science News Letter, November 22, 1930

CHEMISTRY

Honored for Research on Chemistry of Blood

Value of Pure Science Recognized in Award of Nobel Prize To Professor Hans Fischer of Munich, Germany

THE AWARD of the 1930 Nobel Prize in chemistry to Prof. Hans Fischer of Munich, Germany, for his research on human blood is a recognition of the value of what is sometimes called pure science, that is, discoveries or developments which are of great theoretical importance but which may or may not have practical value.

Prof. Fischer's recent noteworthy con-

tribution was the synthesis, or laboratory production, of hemin, which is one of the components of hemoglobin, the red coloring matter of the blood.

Hemin has also been called the respiration ferment, said to rule the organic world. In the higher animals, hemoglobin is a transport agency for oxygen, carrying it from one place to another in the body, but the respiration

ferment, hemin, takes up the atmospheric oxygen, which was transported by the hemoglobin, and transfers it to certain organic substances which in turn become oxidized. The respiration ferment is found in all living cells.

Prof. Fischer's synthesis of hemin made possible the artificial production of hemoglobin itself, which is indispensable for the life of animals, especially mammals.

When Prof. Fischer announced this synthesis last year, scientists hailed it as an important contribution to the chemistry of living matter. Some claims were made for it on practical grounds, but Prof. Fischer himself did not agree with these views.

"Contrary to many fantastical statements of the daily press no changes will take place in the field of therapeutics [treatment]" he said, "since hemin has been easily obtainable from blood for a long time. It is improbable that the intermediate products of the syntheses and the numerous isomeric hemins, on which work is being done, will gain a practical importance but their investigation is of interest from a theoretical viewpoint."

Prof. Fischer was born at Hoechst-am-Main in 1881. He studied at the University of Lausanne, at Marburg, where he received the degree of doctor of philosophy, and at Munich, where he was made a doctor of medicine. He has been on the faculties of various German universities and is now head of the Organic Chemical Institute of the Munich Technical High School.

Science News Letter, November 22, 1930

AVIATION

Pilot Can Now Land His Plane Without Seeing the Field

Curved Course to the Ground is Indicated on Instrument Board by Ingenious Use of Short Wave Radio

AVIATORS can not only fly from city to city without ever seeing the ground, but now it is possible for them to make a perfect landing on a field completely enveloped in the densest fog, that not even the most powerful light beacon can penetrate. That is, they can do so if their plane and the field are equipped with the newest radio apparatus developed by the Bureau of Standards. By experiments made at the College Park airport, near Washington, H. Diamond and F. W. Dunmore, two of the Bureau's radio engineers, have developed the new system.

Two radio sets are used. One is the same set used for receiving the powerful radio beacon signal in flying between cities. This is also used for the reception of spoken orders, and other signals received with head phones. For landing at the proper angle, an ultra-short wave receiver is used, as the signals for this are of about $3\frac{1}{2}$ meters wave length, or 93,700 kilocycles.

The system developed several years ago for guiding the plane over the route makes use of two beam antennae. Each

sends out a signal mainly in a certain direction. The two are oriented at right angles to each other, one to one side and the second to the other side of the route. As the plane flies half way between the two beams, the two signals are received with equal intensity, but if the pilot wanders to one side or the other, one signal becomes more powerful.

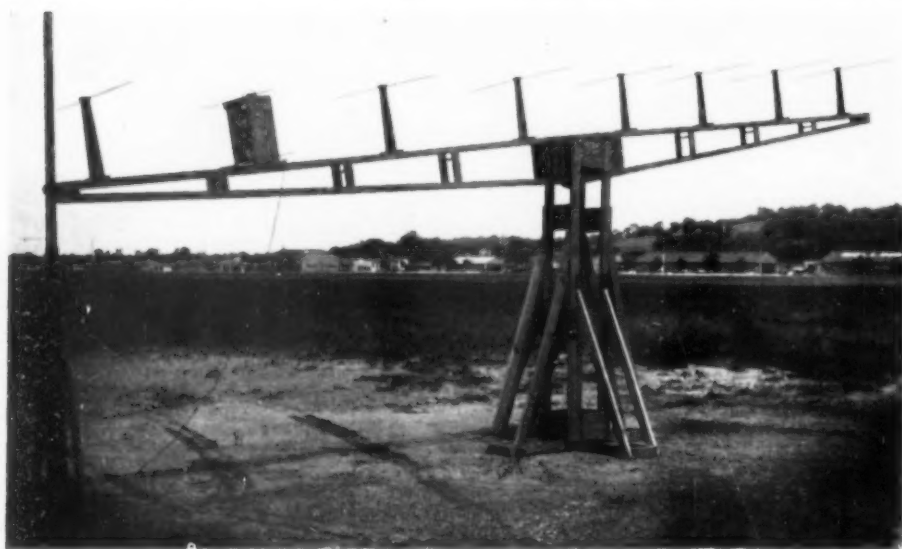
The bureau has developed two types of indicators for this arrangement. In one, a pointer on a dial remains at zero when both signals are equal, and moves to the proper side when one becomes more intense. In the other type, there are two vibrating reeds, the ends of which appear as two white bands on the instrument board. When both are the same length, the pilot knows that he is flying the proper course, but if one becomes longer, it indicates that the ship is off in that direction.

An arrangement exactly the same, but using lower power and smaller loop antennae in the transmitter, is used to give the pilot the direction of the runway on which he is to land. But in addition to the direction, he wants to know just when he is over the edge of the field, and when he is gliding at the proper angle.

To tell the boundary of the field, another type of transmitter is used, in which the signal, heard in the head phones, is loud as the pilot approaches the field, but disappears completely as the pilot is directly over the antenna, which is placed at the edge of the field.

To tell the proper angle at which to glide, the engineers have developed a very ingenious arrangement making use of signals at a very high frequency, or short wave length. These can be directed very accurately in a narrow beam. However, the pilot should not bring his plane down along a straight line, but along a curve, first dropping rapidly, then flattening out as he approaches the ground.

Along the center of the radio beam is the line of the greatest signal strength, but a short distance away it drops con-



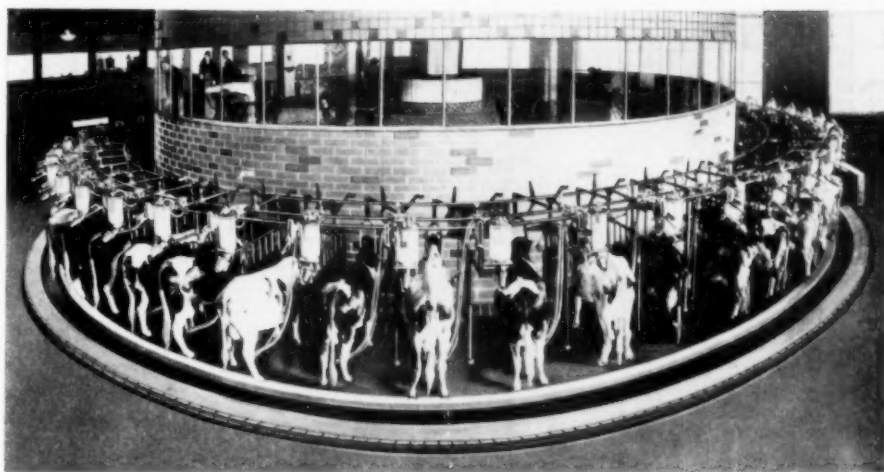
SENDS SIGNALS FOR AIRPLANES TO GLIDE DOWN

Airplanes can land in the densest fog if the field is equipped with the apparatus shown above and the plane with the proper receiver. This is the directive antenna which transmits a very high frequency signal in a very narrow beam. The plane coasts down this beam like a sled down a snowy hillside.

siderably. However, the nearer the transmitter, the louder is the signal. Therefore, if the pilot hits the beam head on near the center, then starts to drop, and, as he does so, approaches closer to the field, the signal will remain of the same strength, because the approach to the transmitter compensates for the greater distance from the center of the beam.

The curve along which the signal maintains a constant strength is just about the same as the best landing curve. A meter on the instrument board indicates the signal strength, and is adjusted so that the pointer is at the center when the pilot follows the proper landing curve. It indicates either "too high" or "too low" if he departs from the right direction.

Science News Letter, November 22, 1930



MECHANICAL MILKMAID MILKS FIFTY COWS

This rotolactor gives each cow a shower bath and relieves the cow of her milk automatically. There are fifty milking stalls on the sixty-foot revolving table.

AGRICULTURE

Rotary Milking Machine Brings Factory Methods to Farm

New Invention, Only One of Which Has Been Made, Milks 1800 Cows Three Times in Eight-Hour Day

THE dairy farm has joined the industrial revolution and now cows are bathed, relieved of their milk and sent back to their barns by automatic machinery that resembles the constantly moving assembly line of a large automobile factory.

A rotary combine milker or "rotolactor" just put in commercial use for certified milk production at the Walker-Gordon Laboratories farm or "milk factory" near Plainsboro, N. J., milks fifty cows simultaneously with less cost, greater speed and less danger of contamination of milk than the old method of individual milking practiced for centuries.

Upon a sixty foot circular platform there are fifty milking stalls. Each cow in turn steps upon the moving platform into a stall, where she is held in place by an automatically closed stanchion. As the platform slowly rotates, the cow receives an automatic warm water shower bath while above her the milking machine and milk jar of her stall is being cleaned and sterilized by machinery. Next the cow receives the attention of the attendant whose sole duty consists of drying the udders with individual sterilized towels. Next the

cow is inspected by an expert hand milker who merely starts the milking process, which is accomplished by milking machines.

Just 12½ minutes after the cow steps on the milking merry-go-round the milking is complete, the cow is automatically released to walk back to her barn for a dinner of special dehydrated alfalfa and other feeds to give a balanced ration. The jar containing her milk automatically empties into a weighing and recording device and flows through pipe lines leading to the bottling plant.

Under this new system the cow goes to the milking machines instead of the milker visiting the cow. Even this walk that the cow must take single file through the runways leading to and from the special rotolactor building contributes to her health. For these walks for her milkings three times daily give her just the amount of exercise she needs.

Under this new system the cow barns become living and dining quarters exclusively and milking is done under the most hygienic conditions in the tiled rotolactor room which is fed with conditioned air.

In an eight hour day of continuous

operation the rotolactor when put into full time operation will milk some 1800 cows three times daily. At present there is only one rotolactor in existence, designed and perfected by the staff of the Walker-Gordon Laboratories farm under the direction of Henry W. Jeffers, president. Studies of feed production, both scientific and economic, and nutritional studies of the milk are among the extensive research projects under the direction of Dr. H. E. Van Norman of the Borden Research Foundation, of which the Walker-Gordon Laboratories are a part. These other studies supplement the development of automatic dairying machinery like the rotolactor.

Science News Letter, November 22, 1930

PUBLIC HEALTH

Car Sickness Less Common

POOR vision makes you more likely to get sick when riding on cars or in automobiles, although car sickness is based on irritation of that part of your ears known as the labyrinth, Dr. J. E. Lebensohn has just reported in the *Archives of Ophthalmology*. This distressing condition is becoming less common, however, as a result of smoother roads, easier riding cars and automobiles.

People who have faulty vision or eye muscle balance are more easily nauseated and have a digestive tract especially susceptible to further depressing influences. An empty stomach is particularly sensitive, so it is best not to fast when traveling. The visual disturbances should be corrected, Dr. Lebensohn advised.

Science News Letter, November 22, 1930

ANTHROPOLOGY

What Color Are Your Eyes?

"A Classic of Science"

Learn From the Great French Criminologist Whether Your Eyes Are Pigmented Orange or Pure Maroon

ALPHONSE BERTILLON'S METHOD FOR IDENTIFICATION OF CRIMINALS, *anthropometric identifications. Translated from the French by Gallus Muller, clerk of the Illinois State Penitentiary. Joliet, Ill., 1887.*

1. The prevalent confusion in designating the color of the eye arises largely from the necessity one is put to, while taking descriptions so called, to ascertain the color of the iris under different lights. Thus, for instance, a dark blue eye turned from the light, observed at a distance of several metres, appears black, owing to the contrast of the dark colored iris, with what is commonly called, the white of the eye.



EYE TO EYE WITH A CRIMINAL.
Bertillon records color of the left eye only.

2. The so-called "gray" eye, is generally nothing else but a blue eye with a more or less yellowish tint, appearing gray on account of the shadow cast by the eyebrows.

3. All other qualificatives in use for designating the color of the eyes, participate in this confusion, and must be left out of consideration by the reader, from the very start of this study.

4. The first thing to be observed in analyzing in a uniform way the color of the iris, is that the examiner stand opposite his subject at a distance of about 30 centimetres, his back to the light so that the eye to be examined is struck by a full strong light (not the rays of the sun, however). Then he orders the subject to look him straight in the eye, and lifts lightly with his right hand the middle of the subject's eyelid.

5. It sometimes happens that the iris, observed in that way, presents notable differences in color and shade between the right and left eye. It is however recommended to base the observation exclusively on the left eye, which faces the right of the operator. The only exception to this rule is made when the left eye is permanently deteriorated either by a film or an inflammation, or by the socket being altogether vacuous while the right eye remains sound.

6. The examiner must not write down any of his observations, until he has closely examined the condition of the eyes of a certain number of individuals, and not until he is fully posted on the principles of the system of notations hereinafter explained.

7. The eye ball consists of a central circle, called "pupil," and a colored circular band, called "iris."

8. Speaking of the color of the eye, it is the iris which is meant, the pupil always being black in the lightest as well as the darkest eyes.

9. On the iris two principle zones are distinguished, the color of which generally differs. 1. The central or pupillary zone sometimes called "areola," or

small circle, or circle simply. (It borders the pupil); 2. The peripheric or external zone (the part of the iris next to the white of the eye).

The basis of our notation rests upon this point, to wit: There is found in the human race but two fundamental types of eyes, the blue eyes and the maroon eyes. All other shades must be considered as intermediate between these two types.

11. We understand by blue, or better expressed, impigmented eyes (what follows will make this word more comprehensible), the pale blue, azure blue, violet blue and slate blue eyes. These adjectives are definite enough for themselves. We may add that these subdivisions are frequently difficult to define. Many eyes of more or less bluish tint may participate in two or three of these qualifications at once.

12. The maroon eyes have a unique tint, which reminds one of the shell of the marron (French Chestnut) when the fruit is ripe and fresh, and the shell slick and shining. It is the black eye, the eye of the Arab, the negro, and of people from southern climes generally. The shade of this eye is more or less deep, more or less light, but its general aspect is more uniform than that of the series of blue eyes.

13. As far as the intermediate eyes are concerned, which constitute three-fourths of the eyes of the Caucasian race, most of them clearly approach either the impigmented eye (pale, azure, violet or slate blue) or the maroon eye. The intensity of their pigmentation, however, is the base of their denomination, and of the classification ensuing therefrom.

Pigmentation

14. By pigment of the eye we mean the more or less yellowish-orange colored matter which is observed in most eyes, when they are examined under the conditions of light laid down at the beginning of this chapter (§ 4). The more abundant this pigment is in the eye, the darker it appears and the nearer it approaches the maroon.

15. In most cases this yellowish-orange colored matter is grouped in the shape of a circle or areola around the

pupil, and sometimes in little dots or small triangular spots in the peripheric zone.

16. The four varieties of pigmentation, which serve for the notation and classification of intermediate eyes, are yellow, orange, chestnut and maroon.

17. Eyes of an incomplete maroon color, in other words, those whose surface is not entirely covered with maroon, are subdivided as follows: 1. *Maroon circle*, where the maroon is grouped around the pupil. 2. *Irisated maroon*, where the pigment enters besides a portion of the peripheric zone, and leaves only exposed on the surface of the iris, small triangular or crescent shaped spots, either of greenish yellow or of dark slate-blue color.

18. This distinction between *circle* and *irisated* is also applicable to other pigmentations, but as a descriptive information only, without calling for subdivisions.

19. To resume: The sub-divisions finally obtained appear in the following classification, in which a place is found for eyes of every description:

1. Impigmented (that is, the iris is entirely without the yellowish-orange matter).
2. Pigmented yellow.
3. Pigmented orange.
4. Pigmented chestnut (incompletely).
5. Pigmented maroon in circle.
6. Pigmented maroon irisated.
7. Pigmented pure maroon.

This scale of colors must be learned by heart, so that it may be recited without hesitation, from top to bottom and vice versa. It is important to be closely posted on the meaning of each of these expressions.

20. The yellow pigment is very much alike to pulverized sulphur (pale yellow).

21. The orange is not exactly the color of the peel of that fruit but rather what the painter calls, yellow ochre.

22. The chestnut resembles burnt sienna, or the shell of a dry dusty chestnut.

23. In practice, and in the absence of a comparative scale, the varieties of pigmentation of the eye are classified by concentrating the observation on the following points:

1. The yellow is distinguished from the orange by the manifest absence of reddish tints or by a very scarce pigmentation.

2. The orange from the chestnut, by a more vivid shade, not tarnished with black.

3. The maroon is distinguished

from the chestnut by a more velvety, more abundant and deeper pigmentation.

Science News Letter, November 22, 1930

PALEONTOLOGY

Seek More Evidence That Man Knew Extinct Animals

Will Search For New Clues in Gypsum Cave Where Bones of Sloth Were Found With Charcoal Possibly Left by Man

WITH high hopes of uncovering further data bearing on the last phases of the Pleistocene or ice age period in America, and especially on the association of man with animals now extinct, the joint expedition of the Southwest Museum of Los Angeles and the California Institute of Technology has resumed its exploration of Gypsum Cave near Las Vegas, Nev. The work is in charge of Curator M. R. Harrington of the Southwest Museum.

This is the cave which yielded, last spring, numerous bones of the ground-sloth *Nothotherium* together with enormous claws with horny covering still intact and even masses of coarse tawny hair of the same animal; also bones of two species of American camels and at least one type of native horse. All these are well known Pleistocene or ice age species except the smaller of the two camels which seems to be new. This was a tiny variety related to the South American llama, with slender limbs like those of a gazelle.

Even more important was the finding, in every room of the cave, of evidence indicating the association of man with these extinct animals, in the form of charcoal, burnt sticks, flint dart-points and crude wooden dart-shafts decorated with painted designs. These objects were found in the same deposits as the bones of the extinct animals, in some cases at lower levels and in one instance a patch of charcoal, probably the remains of a campfire, was found beneath two layers of ground-sloth dung about eight feet below the present surface.

Near the surface and far above the campfire were implements left by the Paiutes, the Pueblos and the Basket-makers, these last the earliest people hitherto known to have inhabited the southwest.

The finds were considered so important that the Carnegie Institution of

Washington made a grant of money to the Southwest Museum.

It is hoped that during the present season evidence will be found bearing on the question now puzzling to archaeologists and paleontologists—whether man really existed in America twenty or thirty thousand years ago, the time usually assumed for Pleistocene, or whether some of the Pleistocene animals lived on until more recent times.

The scientists hope to find human bones in the older deposits from which it may be determined whether these early Americans were of the primitive type associated in Europe with the low-browed Neanderthal cave man who flourished in the Pleistocene period.

Science News Letter, November 22, 1930

ENGINEERING-PUBLIC HEALTH

Dust Avalanche Falls on London

THE world was shocked by the recent avalanches at Lyons, France, which resulted in many deaths, but last year thousands of tons of dirt, in the form of dust and soot, fell on London. A similar condition is true of any large city where considerable soft coal is burned.

Last year an average of 239 tons fell on each square mile in London. Even this is much less dirt than the Britishers have had to breathe, wash from their faces and clean out of their houses.

Science News Letter, November 22, 1930

Alkaline Earths

The metals of lime, magnesia, and other elements of Group II of the Periodic Table will be described in next week's

143RD CLASSIC OF SCIENCE

ENTOMOLOGY

Fruit Fly Vanished So Ban Is Lifted

QUARANTINE restrictions on Florida fruit and vegetable shipments, designed to protect the rest of the nation against the menace of the Mediterranean fruit fly, have been wholly removed, effective November 15. This restores Florida to complete parity with all other states so far as shipment of these products is concerned.

The decision of the U. S. Department of Agriculture to lift the fruit fly ban followed conferences with Florida officials, including Gov. Carlton and members of the State plant board. It marks the end of a war of man against an insect that began in April, 1929, when the dreaded pest was discovered in orchards near Orlando, in the heart of the citrus belt. Since November 16, 1929, no infestation has been found in a commercial orchard, and only two isolated finds have been made elsewhere.

The lifting of the last of the quarantine regulations does not mean that there will be any relaxation of vigilance against the possible survival and recurrence of infestation. Federal and state officials will cooperate in close inspection of orchards for many months to come, and if a new outbreak threatens action will be taken very promptly to secure the eradication of the insects.

Science News Letter, November 22, 1930

PSYCHOLOGY

Criticize the Boss Without Getting Fired

A CHANCE to criticize the boss without getting fired is being offered some employees in New York City in order to discover just what the worker thinks of his employer.

How the attitudes of employees can be determined without disrupting the organization was explained to the Personnel Research Federation last week by J. David Houser, Raymond Franzen, and H. R. Halsey, New York employment psychologists.

"The first problem, in any study of employee attitude, is to make it impossible for frankness to have any effect upon possible tenure," Mr. Halsey emphasized.

"When employees see that absolute frankness can be expressed without any possibility of that frankness reacting upon them, it is not only possible to expect extreme frankness, but it has been

found that this expectation is justified.

"The method of administration is as follows: Questionnaire blanks whose answers are indicated merely by underlining words are distributed by members of the group immediately after a five or ten minute talk which explains the purpose of the whole procedure. Frankness is asked for and emphasis is laid upon the fact that there is no handwriting upon the papers, that there are no names, no numbers, that collection of the papers can be made in any way desired, exchanging papers, shuffling them, putting them under those on the pile, and that in no case can there be any individual in the company employ at hand to identify papers."

Science News Letter, November 22, 1930

DIETETICS

South Sea Athletes Chewed Sugar Cane

THE EARLY Polynesians used sugar cane in the same way that glucose is used today by runners of Marathon races—to prevent exhaustion, weakness, shock and other distressing symptoms which often follow prolonged physical effort.

Miss Carey D. Miller of the University of Hawaii, who since 1926 has been making a study of the nutritive value of foods of the early Hawaiians, states that "undoubtedly the food value of sugar cane, even in the primitive diet, lay in its relatively high content of readily assimilable carbohydrate."

The juice of sugar cane was used by the Hawaiians in "apu"—medicinal concoctions made of ordinary foodstuffs combined with herbs or herbs alone, taken internally, Miss Miller has found.

Science News Letter, November 22, 1930

ENGINEERING

New Testing Equipment To Aid Canadian Engineers

HEAVY testing equipment of at least 3,000,000 pounds capacity for making tensile, compression and bending tests of construction materials will be an important feature of the new engineering laboratory buildings of the National Research Council of Canada, now being built. This will meet a need felt by mining, railway and other industries by providing facilities for necessary tests which cannot now be secured in Canada.

Welding has been rapidly displacing riveting in construction operations and the new testing equipment will test the

IN SCIENCE

efficiency of welded joints. Other materials which will be tested by the new equipment include: Bridge girders and columns; structural parts of steel buildings; stone pillars and other specimens of stone construction, pit props, pipe lines, wooden beams, mine cables, links of chains, cement blocks and concrete.

Science News Letter, November 22, 1930

MEDICINE

Infantile Paralysis Virus Not Easily Killed

STUDIES showing that the virus thought to cause infantile paralysis is remarkably stable and resists treatment that would destroy a number of dangerous disease germs, have just been reported by Miss B. F. Howitt, of the University of California Hooper Foundation for Medical Research.

The virus is able to resist treatment with chemicals which kill streptococci, staphylococci and colon bacilli. After being precipitated, whirled around in centrifuges at terrific speed, washed, filtered, mixed with acetic acid, heated to 136 degrees Fahrenheit, placed on ice, and otherwise subjected to chemical purification, the fluid thought to contain the virus and also the material taken out of it in the process were capable of causing infection in some instances.

Science News Letter, November 22, 1930

PUBLIC HEALTH

Halt in Cancer Fatalities Held Likely For 1930

THAT this year will mark a halt in the yearly increase in deaths from cancer is the hopeful prediction made by statisticians of the Metropolitan Life Insurance Co. who have been studying the figures so far available for 1930. If a halt does occur, it will be the first in five years. A slight but encouraging decrease in the number of cancer deaths this year has been found in their figures. From January to September, 1930, the cancer death rate among their white policyholders was 76.8 per 100,000 as compared with 77.2 for the same period in 1929.

Science News Letter, November 22, 1930

NE FIELDS

ICHTHYOLOGY

American Shore Waters Yield Fantastic Fish

See Front Cover

CITIZENS of the American midlands will soon have an opportunity to become acquainted with one of the world's most fantastic fishes, when a group of long-horned sculpins, captured by staff members of the Marine Biological Laboratory at Woods Hole, Mass., is placed on exhibition at the Field Museum of Natural History in Chicago.

Though looking like an Oriental dream-dragon, the long-horned sculpin is a native of home waters, being found along the Atlantic seaboard from Long Island to the Gulf of St. Lawrence. Ordinarily it does not display its full armature of fins and spines, but when disturbed or angry it spreads itself out as wide as possible, grins fiercely at its opponent, and in general comports itself like an old-time Chinese soldier of the "false-face" school. It is not all bluff, either, for the long spines can inflict painful wounds on unwary fingers. The sculpin has a further protection in its chameleon-like ability to change color and fade into its background of rocks, barnacles or seaweed.

Science News Letter, November 22, 1930

ANTHROPOLOGY

Australian Savages Five Generations Behind

"IT WILL take at least five generations for the Australian aborigine to adjust himself to European cultural conditions," is the belief expressed by Dr. D. S. Davidson, in a communication just received by Horace H. F. Jayne, curator of the Museum of the University of Pennsylvania, from Australia, where Dr. Davidson is making a study of the natives for the Museum.

Dr. Davidson compares the natives of Australia to the North American Indians and points out that just as it has taken the Indian of the United States three hundred years to become psychologically white, so it is unfair to expect the Australians to assimilate European habits and methods in one generation.

In his letter to Mr. Jayne, Dr. Davidson writes, "It is absurd to argue that the aborigine is less intelligent than the white man because his cranial capacity is less, for the size of the brain is no indication of intelligence. Neither is it possible to argue that his mental development is small simply because he would fail miserably in any intelligence test we could apply."

Science News Letter, November 22, 1930

GENERAL SCIENCE

Offer American Scientists Money For Research

TO AID in research projects that would otherwise be handicapped by lack of equipment, the American Association for the Advancement of Science will distribute a total of about \$3,000 in grants of \$50 to \$500.

Awards will be made during the month of December but all applications for aid must be received by December 1. Recipients of the grants are expected to make a report of their progress of their investigation within a year after the funds are given. The committee consists of Dr. Walter S. Adams, astronomy; Dr. Charles P. Berkey, geology; Prof. Arthur H. Compton, physics; Dr. Karl F. Kellerman, botany; Prof. W. Lash Miller, chemistry; Prof. George H. Parker, zoology; Prof. Oswald Veblen, mathematics, and Dr. William C. White, medicine.

Applications should be addressed to Dr. Burton E. Livingston, permanent secretary, American Association for Advancement of Science, Smithsonian Institution Building, Washington, D. C.

Science News Letter, November 22, 1930

ARCHAEOLOGY

Santa Claus Older Than St. Nicholas

SANTA CLAUS, as a bearded and benevolent pot-bellied kobold, seems to be much older than St. Nicholas, the Christian bishop whose name he has assumed. Among the hundreds of statuettes of pagan divinities dug up in the great Roman temple district recently discovered at Trier are a number that are very good portraits of the Christmas-tide friend of children. What the pre-Christian name of this mythical personage may have been nobody knows as yet, but that he is a real Santa Claus any child could tell you. With his round cheeks, pudgy nose and long beard there is hardly any mistaking him.

Science News Letter, November 22, 1930

ELECTRICITY

Vacuum Tube Becomes Night Nurse Maid

NO MORE sleepless nights for E. S. Darlington of Schenectady, N. Y., proud father of lusty young son and vacuum tube engineer with the General Electric Company. Mr. Darlington has made the vacuum tube play nurse maid to Junior all during the night.

Baby, according to the best modern precept, sleeps in a different room from the parents, but when he cries anxious parents are informed immediately. A telephone transmitter used as a microphone at the crib side brings the infant wailings by wire at the speed of 186,000 miles per second to an amplifier and a loud speaker near the ear of the father.

To soothe Junior, Mr. Darlington turns on a phonograph without getting out of bed, and the recorded lullaby sounds through a loud speaker near the crib. If the lullaby fails to calm, then only must weary father get up and give personal attention. Later he expects to carry on two-way conversation with the child, but at present the inability of both to understand the other makes this impossible.

Science News Letter, November 22, 1930

MEDICINE

Toothpick Caused Pseudo-Appendicitis

HOW a toothpick caused what seemed to be an acute attack of appendicitis was just reported by Dr. Samuel McLanahan of Baltimore to the American Medical Association.

The patient had no recollection of having swallowed the toothpick. He complained of pain on the right side of the abdomen, and from this and other symptoms, the diagnosis of acute appendicitis was made. At the operation, the toothpick was found in the part of the intestine known as the cecum, to which the appendix is attached. The toothpick had punctured the cecum, causing a small abscess.

From the scientific viewpoint, the interesting aspects of this condition were the acuteness of onset, small size of the abscess and location of the trouble. Ordinarily when a foreign body gets into the intestine and perforates it, thus causing an abscess, the latter develops slowly and is consequently a large one by the time of operation, and usually is located in another part of the intestine.

Science News Letter, November 22, 1930

ASTRONOMY

Making a Bigger Telescope

By JAMES STOKLEY

In Which It Is Told

How an infernal sleet storm will enable astronomers to peer into space ten times farther than they can now.

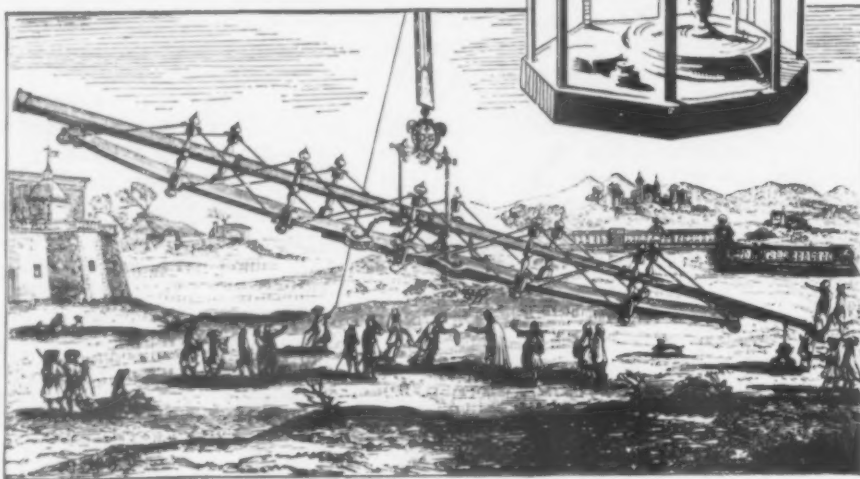
FROM a sleet of quartz three thousand degrees hotter than the icy layers that form on streets and trees in the winter, scientists now promise to create huge mirrors which will reveal the secrets of the universe; to make more healthful windows for nurseries and hospitals and to grind lenses for microscopes that discover the germs of disease.

The chemist often uses a crucible of platinum in which to melt the things he studies, but platinum would flow like water at 3000 degrees Fahrenheit, the temperature of this infernal sleet storm.

Quartz is one of the commonest of minerals. The sand that you idly sift through your fingers as you lie on the beach is mostly quartz. So is your amethyst ring or stickpin. Rock crystal is the clearest of the natural forms, and has long been used to make useful things for scientists.

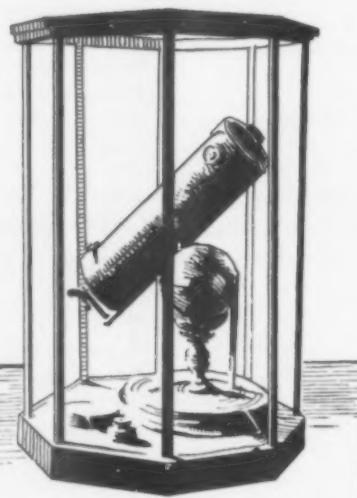
The trouble with crystals is that large ones are rare. Small lenses can be made from them, but not the huge mirrors for telescopes. Well, you say, why not melt the sand or crystals and cast the molten quartz in the shape and size desired?

This was one of the first experiments to be tried, but when quartz is fused in this way it comes out full of bubbles. Some years ago physicists at the



MONSTROSITY AND MIDGET

The huge, clumsy telescope with which the Italian astronomer Bianchini observed the heavens. Such instruments were made unnecessary by the development of the reflecting telescope from Isaac Newton's original model, shown above, and the later development of the achromatic lens.



But a vacuum furnace is not an easy thing to handle if it gets very big, so a way was sought of making it in larger sheets and slabs. Astronomers at the California Institute of Technology are already at work on a new telescope, four times as large and ten times as powerful as the one at Mt. Wilson that is now the world's largest. With this they will be able to gaze farther into the universe around us than they can at present, while the neighboring planets will move still closer to us.

For the seventeen-foot mirror in which these heavenly sights will be reflected, the astronomers called for quartz—superior in many ways to the glass now

universally used in reflecting telescopes. What did it matter if no disc of quartz larger than about a tenth the necessary size had been made? There was a need for huge pieces, so Dr. Elihu Thomson, director of the Thomson Research Laboratory, set to work with his associates to find a way to do it. So confident were the astronomers of Dr. Thomson's ability to deliver a quartz disc when it was needed, that they immediately set to work designing the mounting, without worrying about the mirror problem. The success that has already been achieved at Lynn shows that their confidence was entirely justified.

A Veneer of Quartz

Since none of the methods would yield a disc large enough, the scientist sought for a means of making them still bigger. But this was not so easy. Possibly further research may reveal a

Thomson Research Laboratory of the General Electric Company in Lynn, Mass., discovered that this problem could be solved by melting the quartz in a vacuum furnace. Electricity furnished the high temperature required, the entire furnace was air tight and the air was pumped out. This pulled the bubbles out of the quartz while it was liquid and the material was obtained in a clear glass-like form.

In such a way quartz has been made for many useful purposes. Sheets of quartz for nurseries to let the healthful ultraviolet rays of sunshine in to babies; condensing lenses for concentrating the light of motion picture machines on the film in big theaters; test tubes, flasks and beakers for the use of the chemist in his laboratory—these are but a few of the things that have been made from quartz prepared in the vacuum furnace.

way of making a clear quartz disc in one piece as large as desired, but at present it cannot be done.

How about making the bottom of the disc of one kind of material, and the top part a thin layer or veneer of something else that would take the curves of the mirror? Dr. Thomson thought. The rough white quartz, full of bubbles, could be made large enough, and so efforts were made to use this as a base, with a thin layer of clear quartz on top, in which to grind the figure. With the whole disc of quartz, it would behave as if made in one piece, while the bubbles in the lower part would help reduce the weight.

The first method tried, of putting a clear surface on such a base, was to take a large number of short quartz rods of the same length, stand them on end and close together, and then put the whole in an electric furnace. The quartz would melt, the rods would fuse together, and the resulting slab would be welded to a white quartz base. The tops of the rods would be ground off and a solid surface would result. This was fairly satisfactory, but not completely so, for never was it possible to get rid entirely of the divisions between the individual rods, and a mirror disc made this way presented a honeycomb appearance.

Then a skilled worker of the Thomson Research Laboratory thought of another way of doing it. He took small quartz crystals, of which unlimited quantities are available, ground them up into a fine powder and fed it into the gas stream of an oxyhydrogen blow torch. When oxygen and hydrogen are burned together, they give an extremely high heat, enough to melt quartz.

The Quartz Sleet Storm

As soon as the quartz powder reached the flame it melted into an actual quartz rain. This was applied to a disc of the rough quartz, which was cooler, below the melting point, and so the liquid froze solid as soon as it touched it. You can imagine the delight of Dr. Thomson after he first

tried this experiment, and found that the layer of quartz deposited by the flame was perfectly clear and transparent.

They developed this method, until now a number of discs 22 inches in diameter have been made. Several have already been sent to Pasadena and tests

inches in diameter, and then the 200-inch itself.

Just how long this will take is uncertain, and Dr. Thomson is not hazarding any opinion. But with all the skill that these scientists have obtained with the smaller mirrors, and their practically unlimited resources it seemed to a group of astronomers who recently saw the process at work that a few more years will see this part of the work completed.

It will take just about as long for the mechanical parts of the mounting to be designed and built, so all concerned are confident that when the Pasadena astronomers are ready to start final work on the great mirror, they will have the disc to work on. The small discs made in the preliminary work will not be wasted, for a great reflecting telescope requires a battery of lesser ones to work in conjunction with the big mirror.



SAMPLE MIRRORS OF QUARTZ

Made by the sleet storm being inspected by prominent astronomers. Left to right; Dr. A. L. Ellis, assistant director, Thomson Research Laboratory; Dr. Harlow Shapley, director, Harvard College Observatory; Dr. Elihu Thomson, director, Thomson Research Laboratory; and Dr. Ernest W. Brown, of Yale University, president of the American Astronomical Society.

made there show that they will be entirely satisfactory.

The furnace in which they are made is lined with fire brick. In the cover is a narrow slit that the blow torch hangs in. This is attached to a lathe bed, providing an automatic mechanism for slowly moving the torch back and forth across the base, depositing several pounds of quartz in an hour. A complete disc can be made in a couple of days, and then taken out and cooled, all ready for grinding.

In fact, the present limit to the size is set not by the difficulty of applying the clear veneer, but in making the rough base. It happens that the largest furnaces now at the Lynn laboratory will just take a 22-inch disc with crowding. With larger furnaces, it should not prove at all difficult to make them many times as large.

Dr. Thomson and his colleagues are now designing a furnace to make a 60-inch base. This will probably be ready soon, and then a disc as large as that of the fourth largest telescope in the world will be made. With several completed, and the technical difficulties solved, they will then tackle one 100

Much Still To Be Done

Of course, a great deal yet remains to be done. Even when the discs are made, their forming by polishing will be no easy task. But because of the slight temperature changes, quartz can be corrected much more easily than glass, even though physically it is harder.

Several years were required to polish in order to form or figure the 100-inch mirror now in the Mt. Wilson telescope. When started, probably the work on the 200-inch quartz mirror will be finished in a few months. Then it will be put in the telescope, and the astronomers will peer into space farther than they can now, and see closer objects better. But even then they will not be satisfied. Probably before the 200-inch is actually in use, plans will be under way for one with a mirror of 500 inches, or perhaps even larger!

Science News Letter, November 15, 1930

Fruit growers in the northwest are ridding their orchards of insect pests by means of radio, using a series of antennae and ground wires and a generator of high frequency electricity.

PUBLIC HEALTH

Welfare of American Youth Motive of Conference

Committees Including 1200 Members Report How Science Can Aid In Child Care and Protection

HERBERT HOOVER first became known to most of his fellow citizens as the man who fed the starving children of war-torn Belgium. Ever since the close of the war, he has been working for the children of his and our own country who are also starving, some of them for food, some for knowledge and some for wise and tender guidance along the thorny paths of childhood and adolescence. When he became President, one of his early acts was the calling of a nation-wide conference to consider the status of the child and what could be done for him.

As a result the White House Conference on Child Health and Protection met in Washington this week. For over a year the committee and sub-committees, numbering some 1,200 men and women devoted to child interests, had been gathering material, working on their reports. All the advances of modern science were scrutinized to find what use they are to children. Is the average American child any healthier

because we have toxin-antitoxin for diphtheria protection; because we have tuberculin tested herds of cows giving milk that is free from tuberculosis germs? Is he any happier or better educated because we can grade the intelligence of adults and children by standard tests; because we have nursery schools and pre-kindergartens springing up in most of our cities?

The President and the White House Conference wanted to know which scientific and economic developments of recent years can help each child in America. They wanted to know how the great mass of knowledge about children and child care can be put into use in every school and home in the land.

"The ideal to which we should drive," said President Hoover speaking at an earlier meeting on child health, "is that there should be no child in America that has not been born under proper conditions, that does not live in hygienic surroundings, that ever suffers from under-nutrition, that does not have

prompt and efficient medical attention and inspection, that does not receive primary instruction in the elements of hygiene and good health."

How to make the most of the long summer vacation in the American school system was one of the many problems affecting child welfare reported on.

The conference committee on the school child recommended that every school provide opportunities for healthful and creative activities during the long vacation which children have each summer. At present it is felt that there is too much contrast or opposition between school and vacation. The former is too "formal," the latter too "empty." Because less value is at present placed on vacation than on school, it is possible to experiment more with the vacation period. Various kinds of activities may be tried and the successful results may be applied to the school.

"A progressive educational policy should provide an educational and recreational program for the child throughout the year," the committee concluded. The committee on the school child is headed by Dr. Thomas B. Wood, professor of health education in Teachers' College, Columbia University.

Week Vacations

In some parts of the country a school term of 10 or 12 weeks, with a week of vacation between terms, has been adopted. This is based on the opinion that the working efficiency of adults declines after 12 weeks of work without vacation. The proposed 13-month calendar would help in the arrangement of such a plan of school sessions.

Six hours of work is the maximum that should be expected of a child. Consequently if the school day is longer than six hours, periods of supervised play should be included. Children should not be expected to work longer than three hours without food.

Recess periods of 15 minutes during each half-day session are considered advantageous, but they should be made periods of genuine rest, not play, with as complete relaxation as possible and with real quiet.

Throughout its report and suggestions, the committee emphasized the importance of considering the child as a whole. Mind, body and emotional life should all be taken into account when planning an educational system or program.

Science News Letter, November 22, 1930



MUSK OXEN ARE NOW IN ALASKA

for the first time in more than 70 years. The experimental herd of 34 young animals imported from Greenland via New York and Seattle has arrived in excellent condition at the Reindeer Experiment Station of the U. S. Biological Survey near Fairbanks. It is expected through this herd to establish musk oxen in Alaska in large numbers as they were before killed out by Eskimos when Alaska was owned by Russia. The flesh of the animals is considered excellent food.

GENERAL SCIENCE

Researches Assisted By
National Research Council

INVESTIGATION of the speed and characteristics of eye movements as a sign of the adequacy of adaptive behavior in children and adults and a study of X-rays comprise two of the eleven widely varying problems of research, attack on which has been assisted by grants recently made by the National Research Council.

The study on reflex and voluntary eye movements is being conducted by Dr. Roland Travis, associate professor of psychology, Western Reserve University. The study of diffraction of X-rays by polar molecules subjected to high steady and alternating fields, is being conducted by Dr. Arthur A. Bless, associate professor of physics, University of Florida.

Other appropriations made by the Research Council's Committee on Grants-in-Aid were distributed among the following investigations:

An investigation of the width, intensity and structure of the modified line in the Compton effect. This is being studied at Stanford University by Dr. Perley A. Ross, professor of physics.

A criterion for the correlation of Devonian formations is being sought by E. M. Kindle, chief, division of paleontology, Geological Survey of Canada, Department of Mines, Ottawa.

A comparative study of glacial worn and river worn cobblestones, an attempt to find characteristic distinguishing markings, undertaken by Dr. Chester K. Wentworth, associate professor of geology, Washington University.

An investigation of the purine fraction of the nucleic acid molecule by Prof. L. R. Cerecedo of the University of California, a study of the antitoxic value of various carbohydrates by Prof. Harry J. Deuel, Jr., of the University of Southern California, and a study of bird malaria by Prof. Reginald D. Manwell of Syracuse University and a pathological investigation by Prof. Ernest W. Goodpasture at Vanderbilt University.

Research on the endocrines of nutrition by Prof. F. E. Chidester of West Virginia University and a study of the effects of variation in environmental factors and in the technique of cell study on selected types of cells by Prof. James B. Lackey at Southwestern College complete the list of awards.

Science News Letter, November 22, 1930

ARCHAEOLOGY

Remains of Ancient Tribe
Found in Western Mexico

People, Who Were Not Aztec, Made Elaborate Pottery
Now Found By Party From University of California

THIRTY-TWO forgotten sites where Mexican Indians lived before the days of the Spanish conquest have been discovered for science by a field party led by Prof. C. O. Sauer of the University of California.

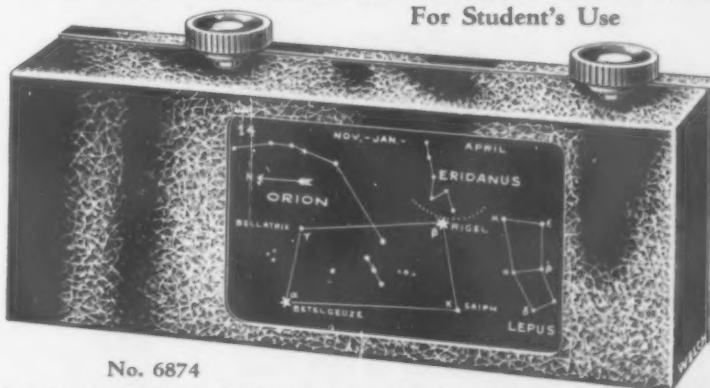
The ruins are on the west coast of Mexico, where the Spaniards broke in and interrupted a high type of Indian culture apparently in its full flower, in 1530. The leader of the Spanish expedition, Nuno de Guzman, was so impressed by the large towns and dense population that he called the region Greater Spain. The Spaniards noted particularly the elaborate feather headdresses worn by the prominent inhabitants, the gold and silver ornaments. They observed that the large cities had fine markets and that there were high-

ways. Within ten years after their arrival the culture had utterly collapsed.

Prof. Sauer's party found mounds and terraced pyramids and a few house foundations. No finely carved stone buildings, like those of eastern Mexico, were reported. These Indians built mostly in perishable materials. Among the smaller objects from their time that have endured are elaborate pottery, two-edged obsidian knives, decorated pipes, and spindle whorls. The culture is named Aztatlan, after the old regional name. The people were not Aztec, but probably like the Toltec.

"The Aztatlan people were lowlanders, tillers of the soil, fishermen, and salt workers, at constant and bitter odds with the cannibalistic highlanders," Prof. Sauer explained.

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All the larger ruins were on the edge of the flood plains or within the alluvium, he found. The rainfall would have been adequate for summer crops of corn, beans and squash without irrigation, and Prof. Sauer finds here evidence that opposes the prevailing view of how American agriculture started. The current theory is that it began in arid regions and with irrigation to make a crop possible, he stated.

Whether different stages of culture can be traced will not be known until the different levels of soil and the ruins can be thoroughly probed. Some of the finds, such as terra cotta figurines and crude stone gods carved out of boulders, suggest the archaic forms of Mexican art. These appear to have been the manufactures of a people older and with more primitive ways than the Indians found by the conquerors.

"The thirty-odd ruins that we visited are an unknown, but probably minor fraction of those that exist in the area," Professor Sauer stated.

Science News Letter, November 22, 1930

A new lubricant, planned especially for marine engines, gives off a warning odor when there is danger of overheating the bearings.

ORNITHOLOGY

Nature Ramblings

By FRANK THONE



Grosbeak

THERE is hardly a part of our country that is not blessed with one species or another of grosbeak. And when the rose-breasted grosbeak goes south to Mexico or Central America for the winter, we may be favored with a glimpse of a pine grosbeak from Canada, come south from too much snow.

Grosbeaks differ in color and pattern, but they are all beautiful. The pine grosbeak is red all over, except for his brown-and-white wings and brown tail; the rose-breasted grosbeak has red only on his upper breast, and has black-and-white wings, black back and head, and white underparts; the evening grosbeak is gay with yellow high-lights. And so on down the line. In shape, however, they are all very much alike: "average" sized birds, running about eight inches in length; and all bear the same family sign, a heavy, strong, blunt beak.

This beak marks the birds as seed-eaters and kin to the finches. The name "grosbeak," in fact, is a reference to it. This seed-eating habit is one thing that makes the birds able to get along in winter weather, when insects are scarce. It may be, too, that the gentle manners of the grosbeaks are due in part to their vegetarian habits. At any rate, it is edifying to watch the conduct of a grosbeak family during nesting season, or of a little flock of them when family cares are over and they are free to indulge in social pastimes. The only thing that ever sets two grosbeaks to fighting is the question of the favor of a lady; that settled, everything is peaceable again.

Science News Letter, November 22, 1930

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See Also
Next Page

Physics

WAVE - MECHANICS—Arnold Sommerfeld, translated by Henry L. Brose—Dutton, 304 p., \$6.25. Prof. Sommerfeld's "Atombau und Spektrallinien," now in its fourth German edition, has deservedly become the standard work on the subject, and Dr. Brose's translation of a few years ago has made it available to English readers. The birth and growth of quantum and wave mechanics since its publication has resulted in a supplementary volume giving the author's views towards the new theories. In the author's preface he states that he is renouncing "the more definite wave-kinematic objective, set up by Schrödinger and de Broglie," and sacrifices "pictorial representation to formalism. But the dualism between the light-quantum and the light-wave extends into the corpuscular region; beside the electron-corpuscle we have the electron-wave with all the accumulative experimental evidence to confirm it." Necessarily the book is highly mathematical, for to write on this subject without mathematics is as impossible as writing a symphony in plain English, without musical notation. But he has described in a convenient form, for one properly qualified, the mathematics needed to understand the theory.

Science News Letter, November 22, 1930

Philology

BABEL OR THE PAST, PRESENT AND FUTURE OF HUMAN SPEECH—Sir Richard Paget—Kegan, Paul, 93 p., 2s. 6d. Sir Richard has long been a student of speech. Now in this volume of the Today and Tomorrow series he recapitulates the fundamentals of speech as he views them and discusses the yesterday, today and tomorrow of our language.

Science News Letter, November 22, 1930

Biography

EDISON AS I KNOW HIM—Henry Ford, in collaboration with Samuel Crowther—Cosmopolitan, 123 p., \$1.50. In this book Mr. Ford, through the typewriter of Mr. Crowther, describes some of the highlights of a friendship that began in 1896. He expresses the opinion that "Edison has done more toward abolishing poverty than have all the reformers and statesmen since the beginning of the world."

Science News Letter, November 22, 1930

Astronomy

PRESENT-DAY ASTRONOMY—J. W. N. Sullivan—Newnes, 143 p., 2s 6d. Here is a new volume in this British publisher's "Outline Library." It is a small, pocket-sized work covering such important astronomical topics as the scale of the universe, the origin of the solar system, the planets, the sun, comets and meteors, the analysis of light, the history of a star and the finite universe.

Science News Letter, November 22, 1930

Journalism

TYPOGRAPHY AND MECHANICS OF THE NEWSPAPER—Kenneth E. Olson—Appleton, 441 p., \$5. The technique of newspaper making, both editorial and mechanical, is covered by the author, who is the professor of journalism at the University of Minnesota.

Science News Letter, November 22, 1930

Anatomy-Medical History

LEONARDO DA VINCI THE ANATOMIST—J. Playfair McMurrich—Williams and Wilkins for the Carnegie Institution of Washington, 265 p., \$6. Here is a book to delight anatomists and those interested in medical history. The author, himself professor of anatomy at the University of Toronto, describes Leonardo's scientific background, his place as an anatomist and scientist, his successful observations and conclusions, his failures, and the extent of his originality. The book is beautifully illustrated.

Science News Letter, November 22, 1930

History of Science

THE ADVENTURE OF SCIENCE—Benjamin Ginzburg—Simon and Schuster, 487 p., \$5. As interest in the history of science increases, it is inevitable that more attention is being given to it in the publishing field. And it is regretably inevitable, perhaps, that those with a philosophical viewpoint will attempt to expound "the intellectual epic represented by the adventure of science," as the publishers' blurb puts it. The lineal intellectual descendants of the great figures of science are more careful, less positive and less ambitious in their humanizing science. Research scientists will object to the attitude with which this book is written. Ambiguous and misinterpreted statements will annoy those who know and mislead those who wish to know.

Science News Letter, November 22, 1930

Recreation

A STATE PARK ANTHOLOGY—Herbert Evison—National Conference on State Parks, 200 p., \$2.50. All persons interested in any phase of the great state park movement in America will want this book. Mr. Evison has made a most judicious and happy selection of addresses, reports and other utterances of informed and authoritative persons, which have hitherto been published, if at all, only in the most scattered and frequently inaccessible places.

Science News Letter, November 22, 1930

Archaeology

ANCIENT LIFE IN THE SOUTHWEST—Edgar L. Hewett—Bobbs-Merrill 392 p., \$5. A comprehensive account of the Pueblos and other groups of the Southwest, narrating their culture history and telling of archaeological investigations at pueblo ruins and cliff dwellings. Explaining in the foreword how he came to add a new book to the "sizable library" of works on the Southwest, Dr. Hewett writes: "Obviously, the book our publisher wants is of a different sort; perhaps a correlation for students and general readers of the essential facts in the natural history and the life of man in the Southwest; a delineation of the whole as a panorama of natural phenomena and cultural expression stretching across the ages; in short, a work that might aid in the comprehension of the forces which have combined to shape this fascinating region for a unique place in world history."

Science News Letter, November 22, 1930

Pediatrics

THE FIRST YEAR OF LIFE—Charlotte Buhler—John Day, 281 p., \$3.50. Exhaustive records of the behavior of sixty babies in their sleeping and their waking moments comprise this book on infant psychology and make it of great practical interest to parent and nurse as well as to physician and student. Although extremely guarded in drawing conclusions, the author has presented the evidence so directly and the material with which she deals is so inherently interesting, that she has succeeded in making the book interesting to the lay reader without sacrifice of technical accuracy and thoroughness. And from the great mass of details, tirelessly observed and minutely recorded, there emerges a human picture of the developing infant.

Science News Letter, November 22, 1930

• First Glances at New Books

See Also
Page 335

Mathematics

NUMBER: THE LANGUAGE OF SCIENCE—Tobias Dantzig—*Macmillan*, 650 p., \$3.50. Every scientist realizes the importance of mathematics, but except for the professional mathematician, probably few people ever find an ordinary mathematics book really interesting. But this book by Professor Dantzig is far from being an ordinary book, for it can be read with real pleasure not only by the scientist, but by the educated layman as well. As he says in his preface, "This book deals with ideas, not with methods. All irrelevant technicalities have been studiously avoided, and to understand the issues involved no other mathematical equipment is required than that which is offered in the average high-school curriculum." Number forms the foundation of mathematics, and in this book are covered such topics as the development of counting from the use of fingers, the origin of zero, the notion of infinity, prime and perfect numbers and series. The fluent style of the author, though he is of Russian birth, helps make it as fascinating as any story of adventure.

Science News Letter, November 22, 1930

Physics

THE PRINCIPLES OF QUANTUM MECHANICS—P. A. M. Dirac—*Oxford*, 257 p., \$6. In the younger generation of physicists, the name of Dr. Dirac is outstanding. He makes an attempt, in this necessarily rather technical treatise, to survey the situation and to put what is already known into a more systematic form. It is the opinion of many that such a procedure is needed for future progress. Since Dr. Dirac himself is one of the main builders of the new theory, the book will find a wide welcome among physicists. (N. B.—Why does any publisher issue a book like this without an index?)

Science News Letter, November 22, 1930

Chemistry

SPIRAZINES—Carl F. Krafft—*Author*, Box 1421, Washington, D. C., 54 p., \$1. An interesting theory of space arrangement of atoms in compounds resulting from, and taking part in, living processes. To the chain and ring structures of classical chemistry the author adds a helical spiral which seems to offer a better mechanism for more complicated groupings.

Science News Letter, November 22, 1930

National Parks

NATIONAL PARKS OF CANADA: REPORT OF THE COMMISSIONER, YEAR ENDED MARCH 31, 1929—*Department of the Interior, Canada*, 43 p. This brief report chronicles gratifying progress in the development of existing national parks in Canada and in the acquisition of new sites.

Science News Letter, November 22, 1930

Ichthyology

MIGRATIONS AND OTHER PHASES IN THE LIFE HISTORY OF THE COD OFF SOUTHERN NEW ENGLAND—W. C. Schroeder—*Government Printing Office*, 136 p., 45 c. Of interest to ichthyologists and commercial fishermen.

Science News Letter, November 22, 1930

Botany

SOME FAMILIAR WILD FLOWERS—J. E. Jones—*Macmillan*, 82 p., \$1.50. This little book consists almost wholly of excellent photographs of flowers, made by Richard S. Cassels, K. C. The compiler has added concise notes on color, habit, phenology, and uses if any, with occasional poetic interludes.

Science News Letter, November 22, 1930

Astronomy

ETOILES ET ATOMES—A. S. Eddington, traduction par J. Rossignol—*Hermann*, 188 p., 35 frs. This is a French translation of Sir Arthur Eddington's famous work, "Stars and Atoms," published in the United States by the Yale University Press in 1927, and reviewed in the *SCIENCE NEWS LETTER* at that time.

Science News Letter, November 22, 1930

Mythology

THE STARS THROUGH MAGIC CASEMENTS—Julia Williamson—*Appleton*, 241 p., \$2. A collection of mythological stories about the stars, drawn from Greek, Roman, Japanese and Amerindian sources, and intended for boys and girls.

Science News Letter, November 22, 1930

Television

FUNDAMENTALS OF TELEVISION—Thomas W. Benson—*Mancall*, 145 p., \$3.50. A little book describing briefly present-day television methods and containing directions for the construction of apparatus.

Science News Letter, November 22, 1930

General Science

THE ADVANCEMENT OF SCIENCE—*British Association for the Advancement of Science*, 257 p., 5s. In this paper-bound volume are gathered together the addresses given at the recent Bristol meeting by the president of the association and the various section presidents. These include "Size and Form in Plants," by Prof. F. O. Bower (the presidential address); "Theories of Terrestrial Magnetism," by Dr. F. E. Smith; "The Scope and Aims of Human Geography," by Prof. P. M. Roxby; "The Interdependence of Science and Engineering," by Sir Ernest Moir; "The Synthetic Activities of the Cell," by Prof. H. S. Raper; "A Policy of Higher Education," by the Rt. Hon. Lord Eustace Percy; and others.

Science News Letter, November 22, 1930

Chemistry

LECTURES ON COMBUSTION—Joseph Priestley and John MacLean—*Princeton Univ. Press*, 116 p. A reprint of two classic works by early American chemists. Joseph Priestley, the discoverer of oxygen, who migrated to America, is well known; MacLean was a contemporary who was a professor at what is now Princeton University. Priestley's work was originally published in 1796 and MacLean's a year later.

Science News Letter, November 22, 1930

Child Health

CHILDREN OF THE COVERED WAGON—Estella Ford Warner and Geddes Smith—*Commonwealth Fund*, 123 p., \$1. Report of the Commonwealth Fund child health demonstration in Marion County, Oregon, from 1925 to 1929. Besides being an enviable record of progress, it is more readable than are most reports and is well illustrated. Of particular interest to health workers and women's clubs.

Science News Letter, November 22, 1930

Sociology

INTELLIGENT PHILANTHROPY—Edited by Ellsworth Faris, Ferris Laune, and Arthur J. Todd—*University of Chicago Press*, 322 p., \$4. The manifold considerations which should influence the person planning any benevolent undertaking—the social, economic, religious, ethical, and even biological aspects of the problem are here discussed by eminent students in the various fields.

Science News Letter, November 22, 1930